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accident or design, (let it be from its being mixed with iron, or any other cause whatever) brass must be a very improper metal for compass-boxes, as it may occasion many sad and fatal accidents.

Norwich, Octob. 20th, 1758.

It is well known, that brass has been sometimes found to affect and disturb the magnetic needle; but, to give magnetism and polarity to brass, has not, that I have yet heard, been before attempted. I therefore have taken the liberty to lay the above account before this Royal Society, and have also brought the pieces of brass mentioned therein, which have been thus made magnetical.

London,  
Nov. 15. 1759.

H. Baker.

CVII. *An Account of the Sea Polypus, by*  
*Mr. Henry Baker, F.R.S.*

*To the Right Honourable the EARL of MACCLES-*  
*FIELD, President of the Royal Society.*

My Lord,

Read Nov. 23, 1758. I now return the marine animal your Lordship did me the honour to recommend to my examination; which I find to be a species of one kind of the Sea Polypi, mentioned by naturalists; but I think not very accurately described.

The kinds of Sea Polypi are understood to be,  
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*First*, The Polypus, particularly so called, the Octopus, Preke, or Pour-control: to which kind our subject belongs.

*Secondly*, The Sepia, or Cuttle-fish.

*Thirdly*, The Loligo, or Calamary. And each of these has its different species and varieties\*. The ancients add the Nautilus; and some sorts of Star-fish might perhaps be not improperly ranged among them.

All of the first kind have eight arms, placed at equal distances round the head; below the arms are two eyes, and the body is short and thick.

The Cuttle-fish, and the Calamary, have each of them ten arms; of which eight are shorter ones, tapering gradually to a point from the head, where they all rise, to their extremities: the other two (frequently called Tentacula) are three or four times as long, perfectly round, slender, and of an equal thickness for above two thirds of their whole length; then spreading into a form nearly like that of the shorter arms. Great numbers of *acetabula*, or suckers, are placed somewhat irregularly on each of the shorter arms, and on the spreading parts of the Tentacula, where some of the suckers are a great deal larger than the rest.

The body of the Cuttle-fish is broad and flat, having within it a broad friable white bone; that of the Calamary is a sort of cartilaginous case holding the intestines, of a roundish oblong shape, furnished with two fins, and having within it a thin transparent elastic substance like Isinglass.

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\* Vide Wilkins's real Character, p. 131. Bellon. aquat. p. 330.

Fig. IV.

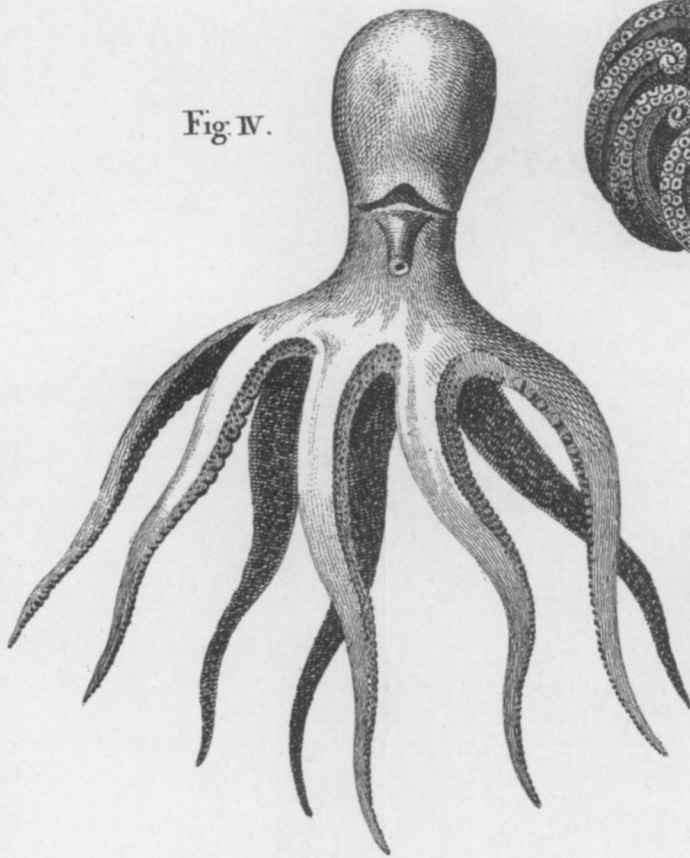


Fig. II.

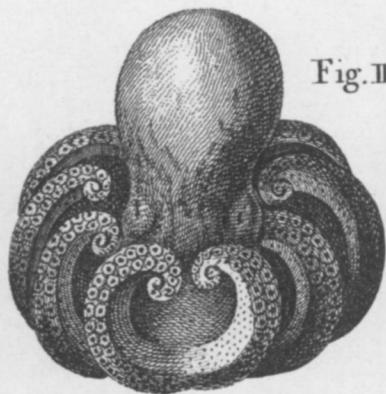


Fig. I.

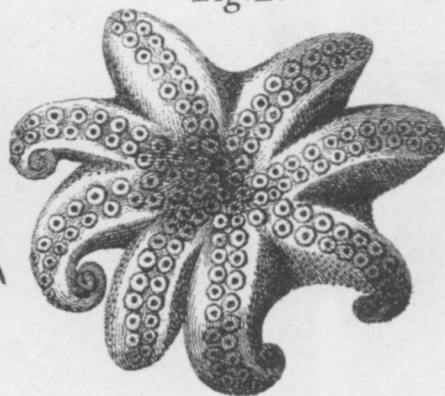




Fig. II.

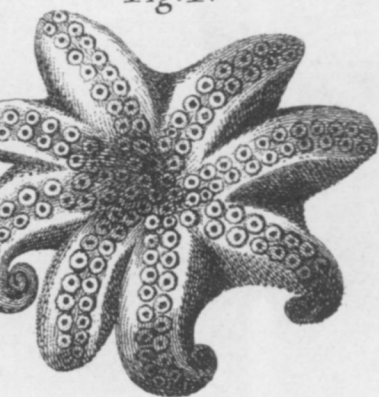


Fig. I.

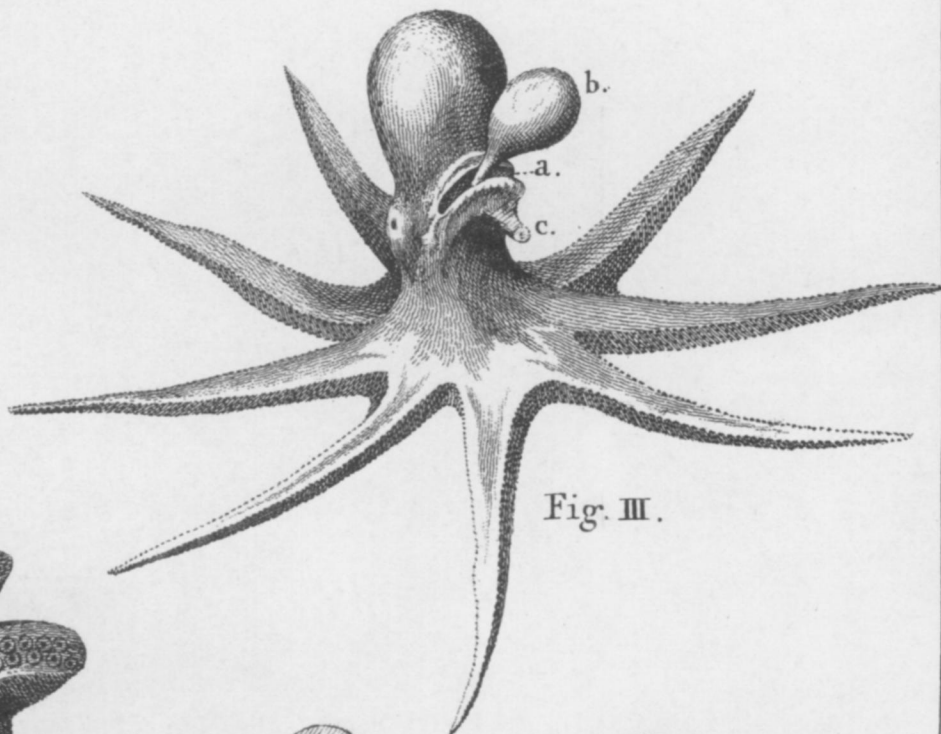


Fig. III.



K



M

The mouth of the Pour-control, Cuttle-fish, and Calamary, is placed in the fore-part of the head, between the arms, having an horny beak, hard and hooked like a parrot's, which some writers call the teeth. The eyes of them all are nearly in the same position.

As the subject under examination resembles in some particulars all the above kinds of Polypi, this short account of them may, it is hoped, render the following description of it the more intelligible: and with the same view, Mr. George Edwards, Fellow of the Royal Society, has been so obliging as to make drawings of the animal itself, in four different positions, and of the natural size; which drawings are herewith presented to your Lordship.

Our Polypus is of the Pour-control kind, and I believe of that species called *Bolytæna*; which is said to have a musky smell; but if ours had such a smell, the spirits wherein it lies have taken it quite away.

In the drawing [See TAB. XXIX. Fig. 1.] is shewn the anterior part of this animal, which has much the appearance of a Star-fish. Here are eight arms about three inches in length, united at their roots, and placed circularly at equal distances in the same plane, which has a considerable sinking towards the center. These arms diminish from their rise to their extremities, and end exceedingly small. Near the head they are quadrilateral, but the under-side contracting gradually to an edge, they become towards the ends triangular. On the upper side of each arm are two rows of *acetabula*, or suckers, standing in a beautiful order, as close as they can well be placed, and beginning from the center of all the arms. These suckers

are perfectly circular, with edges flat on the top, and a round cavity in the middle of each. They are largest in the widest part of the arm, and lessen as the arm diminishes, till they become so small as hardly to be discernable. It is very difficult to tell their number: I counted as far as fifty in a row, but am certain there are many more; and I don't imagine the eight arms have so few as a thousand on them. They rise some height above the surface of the skin; and wherever they are not, the skin of the arms (unless on the under-side) is granulated like shagreen\*.

As in the other kinds of Polypi the mouth is placed between the arms conspicuously enough, I expected to find it so in this; but the spirits had contracted it so much, that I could discern no opening at all where I thought the mouth must be; and therefore could not say, with assurance, that the mouth was placed there. Under this difficulty I applied to Sir Hans Sloane's most valuable collection of natural history in the British Musæum, where I found several species of this kind of Polypi, and amongst the rest a small dried specimen of the same species as ours, and a much larger one in spirits, of a species that comes very near it.

This large specimen afforded the information I stood in need of: for though here also the mouth was closed, and the beak drawn down into the center between the arms, so as not to be seen at all; yet, by the help of Dr. Morton and Mr. Empson, I had the satisfaction to see the mouth opened, and the beak in

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\* Some of the Pour-control kind have but one row of suckers on the arms: such an one I have seen, whose arms were thirty inches long.

the same situation, and of the same form and substance, as in the other kinds of Polypi. Having gained this knowledge, by applying the point of a bodkin, I easily felt the beak in our Polypus ; but in so small a subject it cannot be brought to view without dissection, which is the reason it does not appear in these drawings.

*Fig. 2.* represents the Polypus so placed as to shew the situation of the eyes and the form of its body, and also in what manner the arms are turned back in the specimen before us ; but we may suppose them thus disposed merely in the act of dying, and that when alive they are moveable in all directions.

On that side of the body opposite to the eyes, and which therefore may be termed the belly-part, there appears a transverse slit or opening in the skin, not in a strait line, but a little semicircular ; from the anterior part whereof a tube or pipe proceeds, about one third of an inch in length, smaller at the extremity, where it opens with a round orifice, than at the base, and reaching to within a small distance of the arms. As both the Cuttle-fish and Calamary have a pipe nearly in the same situation, though somewhat different in figure, through which they occasionally discharge an inky liquor, and some writers say the fæces also, it is probable the pipe in this animal may serve to a like purpose ; and as the body of the Calamary is included in a case, the slit across the body of this animal shews its belly part to have also a sort of case, though on its back there is no separation as in the Calamary.

Out of the aforesaid slit or opening a bag issues with a very slender neck, extending towards the tail,  
and



and enlarging gradually to its end. This bag is above half the length of the body, and appears like another body appendant thereto. I should be entirely at a loss concerning this bag, did not some passages in Mr. Turberville Needham's curious observations on the milt vessels of the Calamary enable me to form some conjectures about its use.

Having dissected several Calamaries on the coast of Portugal, without the least indication of milt or roe, and consequently without knowing which were male or female, he was much surprised (about the middle of the month of December) to find a new vessel forming itself in an obvious part, and replete with a milky juice. This was an oval bag, in which the milt vessels formed themselves gradually, the bag unfolding as these framed and disposed themselves in bundles. Before that time he had observed two collateral tubes, which are alike in both sexes; but a regular progress in the expansion of the milt-bag and formation of the milt-vessels had not presented itself before. Those tubes till then appeared open at one extremity, much resembling the female parts of generation in a snail, but did not terminate in a long oval bag extending in a parallel with the stomach more than half the length of the fish, as he found them afterwards when the milt vessels that filled the whole cavity were ripe for ejection. The same ducts without the bag are found in the female also, perhaps for the deposition of the spawn. Vid. *Needham's Microscopical Discoveries*, cap. v.

It appears from this account that the male Calamary (at a certain time of the year only) has a bag wherein the milt-vessels are contained, and that the  
female

female has no such bag. Since therefore the bag of our Polypus is found in the same situation as that of the Calamary, (which is also a kind of Polypus) we may suppose it to be the milt bag, and that our Polypus is a male, taken at a time when the milt was ready for ejection. In the dried specimen at the British Museum, and also in the other specimens, there is the same opening, with the pipe that rises above it towards the arms, but not the least appearance of the bag in question: they are therefore probably females, or if males, were caught before such bag was formed.

*Fig. 3.* presents another view of this Polypus, its arms extended circularly with their under-sides next the eye, and the body so disposed as to shew the transverse opening *a*, the oval bag issuing therefrom *b*, and the pipe rising upwards towards the arms *c*.

*Fig. 4.* shews the Polypus with its transverse opening and the pipe rising therefrom, but without the oval bag; it is figured thus by Rondeletius and Gesner, and the specimen at the British Museum has also this appearance. It is here shewn with the arms extended forwards. *K* is a magnified figure of one of the *acetabula*, or suckers; of which there are two rows on each arm of this Polypus, as before described.

Mr. Needham, in his description of the suckers of the Calamary, (which he had many opportunities of examining whilst alive, and whose mechanism is probably the same as in those of our Polypus) informs us, “ that the action of the suckers depends partly  
 “ on their shape, which, when they are extended  
 “ resembles nearly that of an acorn-cup, and partly  
 “ upon a deep circular cartilaginous ring, armed with  
 “ small hooks, which is secured in a thin membrane  
 “ something

“ something transparent, by the projection of a ledge  
 “ investing the whole circumference about the middle  
 “ of its depth, and not to be extracted without some  
 “ force. That each sucker is fastened by a tendi-  
 “ nous stem to the arm of the animal: which stem,  
 “ together with part of the membrane that is below  
 “ the circumference of the cartilaginous ring, rises  
 “ into and fills the whole cavity when the animal  
 “ contracts the sucker for action. In this state  
 “ whatever touches it is first held by the minute  
 “ hooks, and then drawn up to a closer adhesion by  
 “ the retraction of the stem and inferior part of the  
 “ membrane, much in the same manner as a sucker  
 “ of wet leather sustains the weight of a small stone.”  
 Vid. *Microscopical Discoveries*, p. 22.

M shews one of the cartilaginous rings armed with  
 small hooks, of its real size. The ring this is drawn  
 from was taken out of a large sucker of a larger Po-  
 lypus, and is presented herewith.

By these suckers the Polypus can fix itself to rocks,  
 and prevent its being tossed about in storms and tem-  
 pests; but their principal use must undoubtedly be to  
 seize and hold its prey: and to this purpose they are  
 most admirably adapted; for when they are all ap-  
 plied and act together, unless the Polypus pleases to  
 withdraw them, nothing can get from it whose  
 strength is insufficient to tear off its arms. Some-  
 thing like these suckers is found by the microscope  
 in the minute fresh water Polype, whereby it is able  
 to bind down and manage a worm much larger and  
 seemingly stronger than itself\*. In like manner the

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\* Of this I gave an account some years ago, in my attempt  
 towards a Natural History of the Polype, chap. v.

*Stella arborescens* (which may also be called a Polypus), though it has not suckers, yet by the hooks along its arms, and the multiplicity of their branchings, which have been counted as far as 80,000, it can, by spreading its arms abroad like a net, so fetter and entangle the prey they inclose when they are drawn together, as to render it incapable of exerting its strength: for however feeble these branches or arms may singly be, their power united becomes surprising. And we are assured nature is so kind to all these animals, that if in their struggles any of their arms are broken off, after some time they will grow again; of which a specimen at the British Museum is an undoubted proof; for a little new arm is there seen sprouting forth in the room of a large one that had been lost.

It is evident from what has been said, that the Sea Polypus must be terrible to the inhabitants of the waters, in proportion to its size (and Pliny mentions one whose arms were thirty feet in length); for the close embraces of its arms and the adhesion of its suckers must render the efforts of its prey ineffectual either for resistance or escape, unless it be endued with an extraordinary degree of strength.

Sea Polypi are frequent in the Mediterranean: but Mr. Haviland of Bath, to whom we are obliged for this, which is of a different species, thinks it came from the West Indies, where it is called a Cat-fish. That like it in the British Museum also came from thence.

As the Polypus I have endeavoured to describe is much contracted by lying long in spirits, and dissection would destroy a specimen well worth preserving, I hope to be excused if this account should be

found deficient in several particulars, or chargeable with some mistakes.

Permit me the honour to be,

My LORD,

Your Lordship's

Most humble and obedient Servant,

Strand,  
Nov. 23d, 1758.

H. Baker.

CVIII. *A Description of the fossil Skeleton of an Animal found in the Alum Rock near Whitby. By Mr. Wooller. Communicated by Charles Morton, M. D. F. R. S.*

Read Nov. 23. <sup>1758.</sup> **I**T is in this rock, that the Ammonitæ, or Snake-stones, as they are commonly called, are found, which have undoubtedly been formed in the *exuvia* of fishes of that shape; and though none of that species are now to be met with in the seas thereabouts, yet they in many particulars resemble the Nautilus, which is well known. The internal substance of those stones, upon a section thereof, appears to be a stony concretion, or muddy sparr. Stones of the same matter or substance, in the shape of muscles, cockles, &c. of various sizes, are also found therein, and now and then pieces of wood hardened and crufted over with a stony substance are likewise found in it.

Many naturalists have already observed, that among the vast variety of extraneous substances found at several